PITAGORAS
ACADEMIA

TRIGONOMETRÍA

Profesor
DAVIS REYES

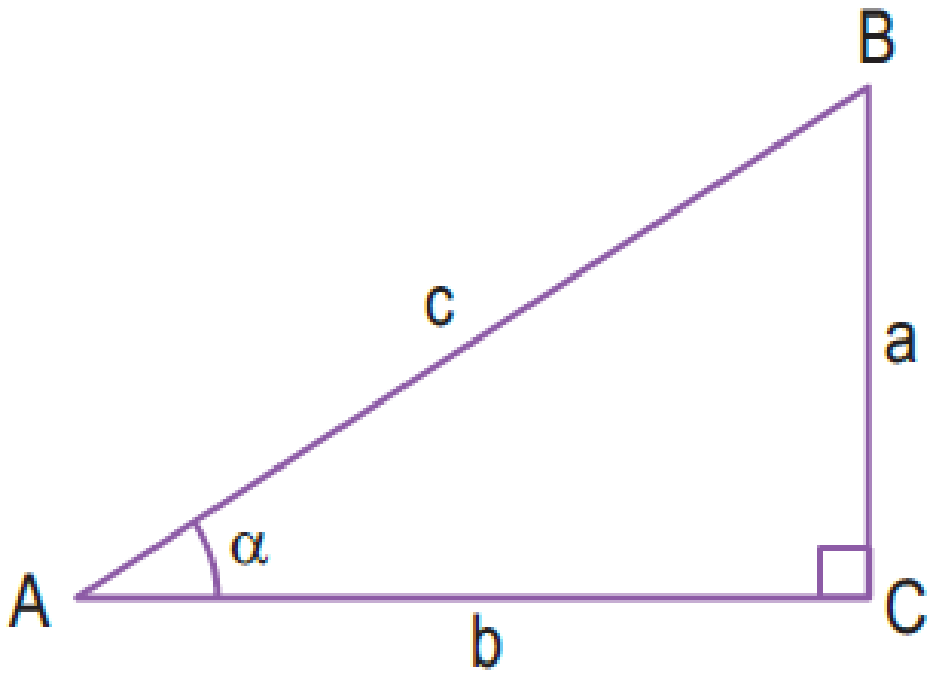
RAZONES TRIGONOMÉTRICAS

RAZONES TRIGONOMÉTRICAS DE ÁNGULOS AGUDOS

R.T DE ÁNGULOS AGUDOS

RAZONES TRIGONOMETRICAS

Sea el triángulo rectángulo ABC:



Para el ángulo A, se cumple:	
$\text{sen}\alpha = \frac{a}{c}$	$\csc\alpha = \frac{c}{a}$
$\cos\alpha = \frac{b}{c}$	$\sec\alpha = \frac{c}{b}$
$\tan\alpha = \frac{a}{b}$	$\cot\alpha = \frac{b}{a}$

R.T DE ÁNGULOS AGUDOS

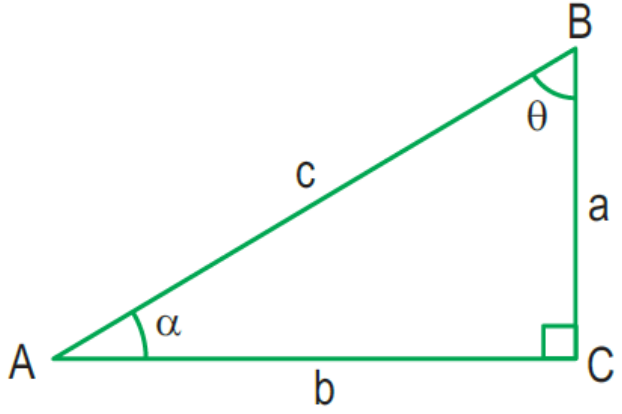
IDENTIDADES RECIPROCAS

$$\operatorname{sen}\alpha . \csc\alpha = 1$$

$$\cos\alpha . \sec\alpha = 1$$

$$\tan\alpha . \cot\alpha = 1$$

RAZONES TRIGONOMETRICAS DE ANGULOS COMPLEMENTARIOS



razón trigonométrica (α) = co-razón trigonométrica (θ)

$$\operatorname{sen}\alpha = \frac{a}{c} = \cos\theta \qquad \csc\alpha = \frac{c}{a} = \sec\theta$$

$$\cos\alpha = \frac{b}{c} = \operatorname{sen}\theta \qquad \sec\alpha = \frac{c}{b} = \csc\theta$$

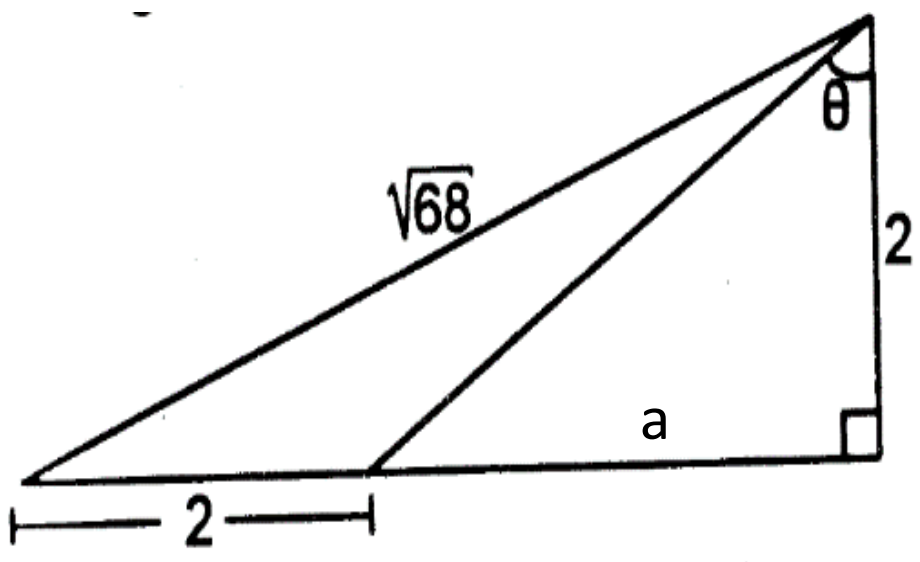
$$\tan\alpha = \frac{a}{b} = \cot\theta \qquad \cot\alpha = \frac{b}{a} = \tan\theta$$

MOMENTO DE PRACTICAR

PROBLEMAS Y RESOLUCIÓN

R.T DE ÁNGULOS AGUDOS

1.-Del gráfico, Calcular Tgθ



A)1 B)2 C)3 D)4 E)5

Resolución:

Obs: a +2 > 0

$$\sqrt{68}^2 = 2^2 + (a+2)^2$$

$$68 = 4 + (a+2)^2$$

$$64 = (a+2)^2$$

$$8 = (a+2)$$

$$6 = a$$

Piden:

$$\text{Tan}\theta = \frac{a}{2}$$

$$\text{Tan}\theta = \frac{6}{2}$$

$$\text{Tan}\theta = 3$$

R.T DE ÁNGULOS AGUDOS

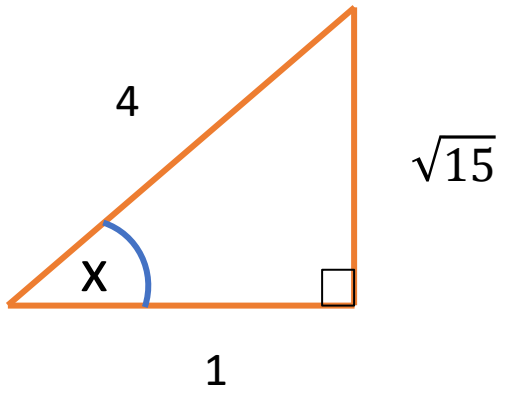
2.-Si: $4\text{Cos}x-1 = 0$: $0° < x < 90°$,

Calcular: $\text{Tg}^2x + \text{Sec}x$

Resolución:

$$4\text{Cos}x-1 = 0$$

$$\text{Cos}x = \frac{1}{4}$$



Piden:

$$E = \text{tg}^2x + \text{Sec}x$$

$$E = \frac{\sqrt{15}^2}{1} + \frac{4}{1}$$

$$E = 15 + 4$$

$$E = 19$$

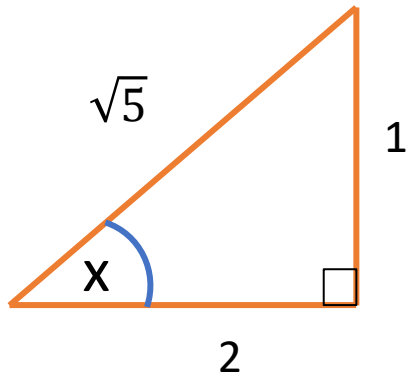
A)4 B)11 C)15 D)19 E)26

R.T DE ÁNGULOS AGUDOS

3.-Si: $\text{Sec}x = 0.5\sqrt{5}$; $0° < x < 90°$.Calcular: $\text{Csc}^2x + \text{Tg}x$

Resolución:

$$\text{Sec}x = \frac{\sqrt{5}}{2}$$



Piden:

$$E = \text{Csc}^2x + \text{Tg}x$$

$$E = \left(\frac{\sqrt{5}}{1}\right)^2 + \frac{1}{2}$$

$$E = 5 + \frac{1}{2}$$

$$E = \frac{11}{2}$$

A)1/2 B)2 C)7 D)11/2 E)$\sqrt{5}$

R.T DE ÁNGULOS AGUDOS

4.-Si: $Tg(5x+8°)Ctg(x+40°)=1$; x es agudo,

Calcular "x"

Resolución:

$$Tg(5x+8°)Ctg(x+40°)=1$$

Entonces:

$$5x+8 = x+40$$

$$5x-x = 40 - 8$$

$$4x = 32$$

$$x = 8$$

A)8° B)10° C)15° D)20° E)25°

R.T DE ÁNGULOS AGUDOS

5.-Calcular "x" Si: Sen3xTgxCtgxCsc(x+20°)=1; X es agudo

Resolución:

$$\text{Sen}3x\underbrace{\text{Tgx}\,\text{Ctgx}}_{1}\text{Csc}(x+20°)=1$$

$$\text{Sen}3x\text{Csc}(x+20°)=1$$

Obs: $3x = x+20$

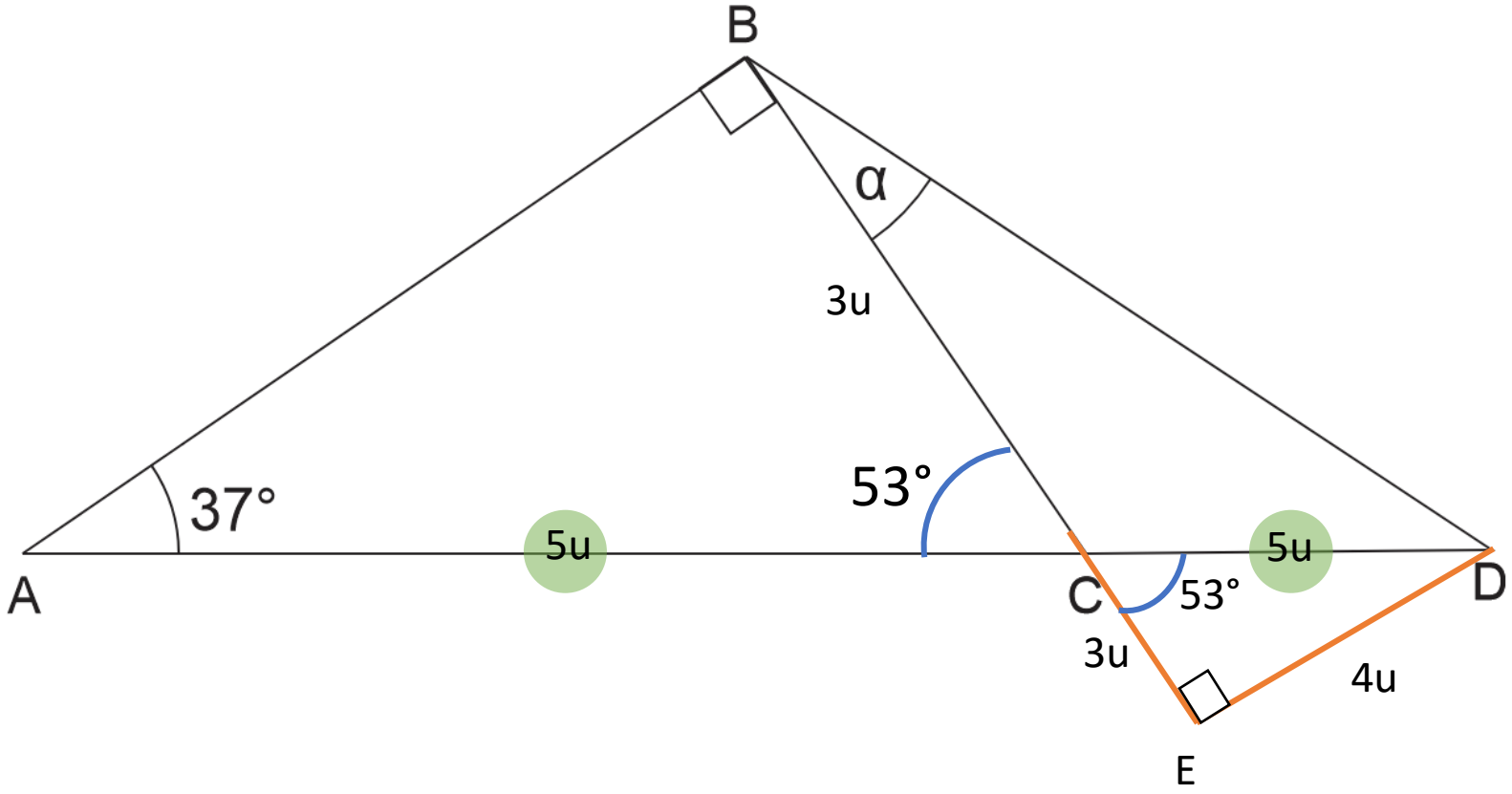
$2x = 20$

$x = 10$

A)5° B)10° C)15° D)20° E)25°

R.T DE ÁNGULOS AGUDOS

6.-Del grafico mostrado, calculé: Tgα. Además: AC = CD.



Resolución:

En el triangulo Rectángulo: BED

$$\text{Tan}\alpha = \frac{4}{6}$$

$$\text{Tan}\alpha = \frac{2}{3}$$

A)1/3 B)2/3 C)1 D)4/3 E)5/3

R.T DE ÁNGULOS AGUDOS

7.-Si para un ángulo agudo "x", se cumple que:

$(\text{Senx} + \text{Sen}30°)^2 - (\text{Senx} - \text{Sen}30°)^2 = \text{Tg}60°$.Calcule "x".

Resolución:

$$\underbrace{(\text{Senx} + \text{Sen}30°)^2 - (\text{Senx} - \text{Sen}30°)^2}_{\text{Identidad de Legendre}} = \text{Tg}60°$$

$$4(\text{Senx})(\text{Sen}30) = \sqrt{3}$$

$$4(\text{Senx})(\tfrac{1}{2}) = \sqrt{3}$$

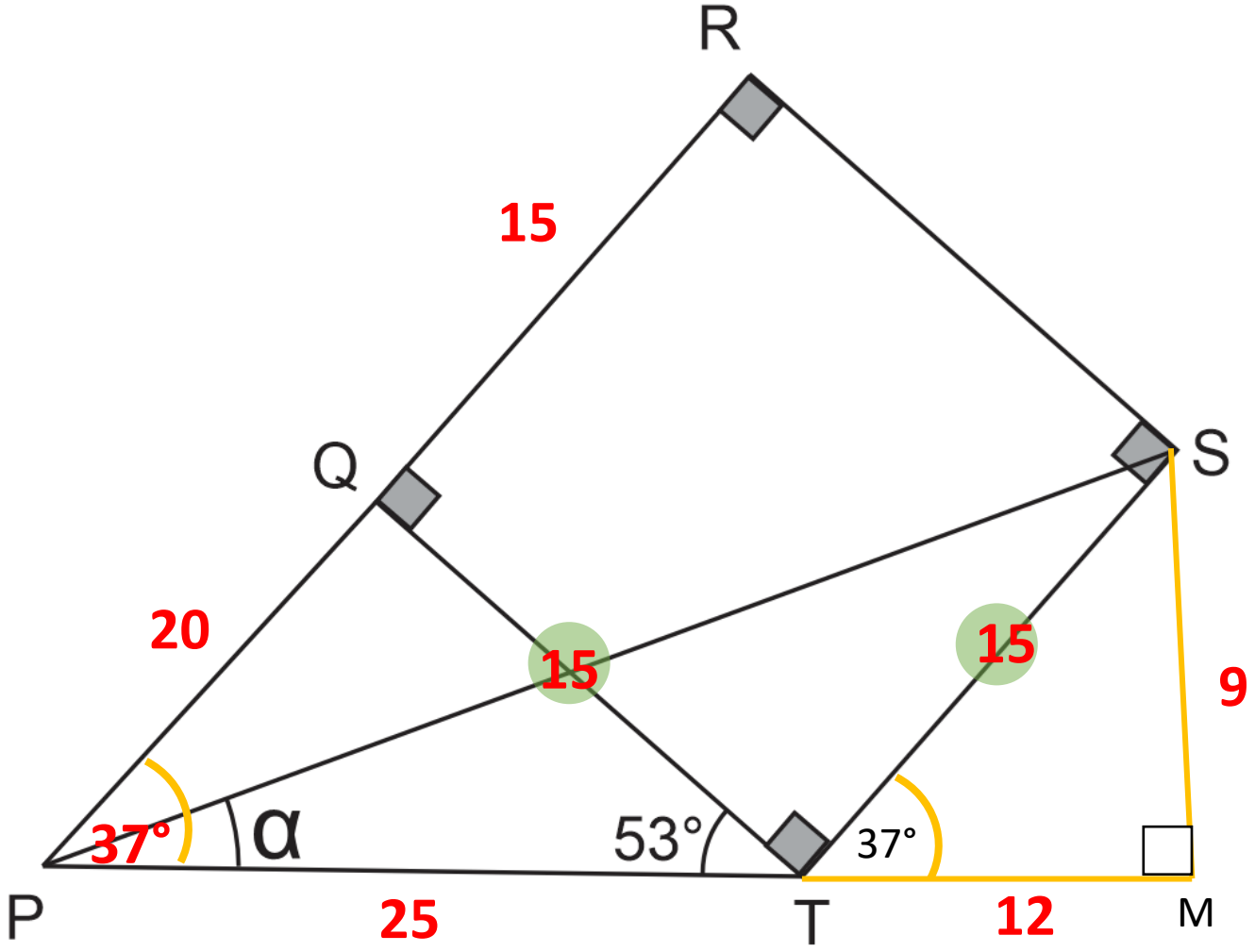
$$\text{Senx} = \frac{\sqrt{3}}{2}$$

$x = 60°$

A)30° B)45° C)37° D)53° E)60°

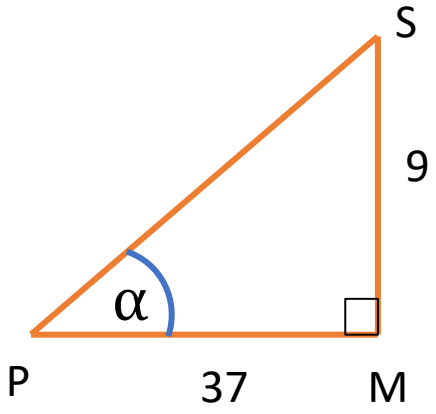
R.T DE ÁNGULOS AGUDOS

8.-Del grafico mostrado; QRST es un cuadrado; PR = 35u.Calcular: Tgα.



Resolución:

En el Triángulo Rectángulo: PMS



Piden:

$$\text{Tan}\alpha = \frac{9}{37}$$

A)1/7 B)7 C)1/4 D)9/37 E)37/9

R.T DE ÁNGULOS AGUDOS

9.-Si se cumple que: $Cos4xSec64°=1$;

$Tg3y = Ctg(2x-2)$, calcular: "x+y"; x,y son agudos.

Resolución:

$Cos4xSec64° = 1$

Entonces :

$4x = 64$

$x = 16$

Dato: $Tan3y = Cot(2x-2)$

Son complementarios:

$Tan3y = Cot(2(16)-2)$

$Tan3y = Cot(32-2)$

$Tan3y = Cot30°$

$Tan3y = Tan60°$

$3y = 60°$

$y = 20°$

Piden:

"x+y"

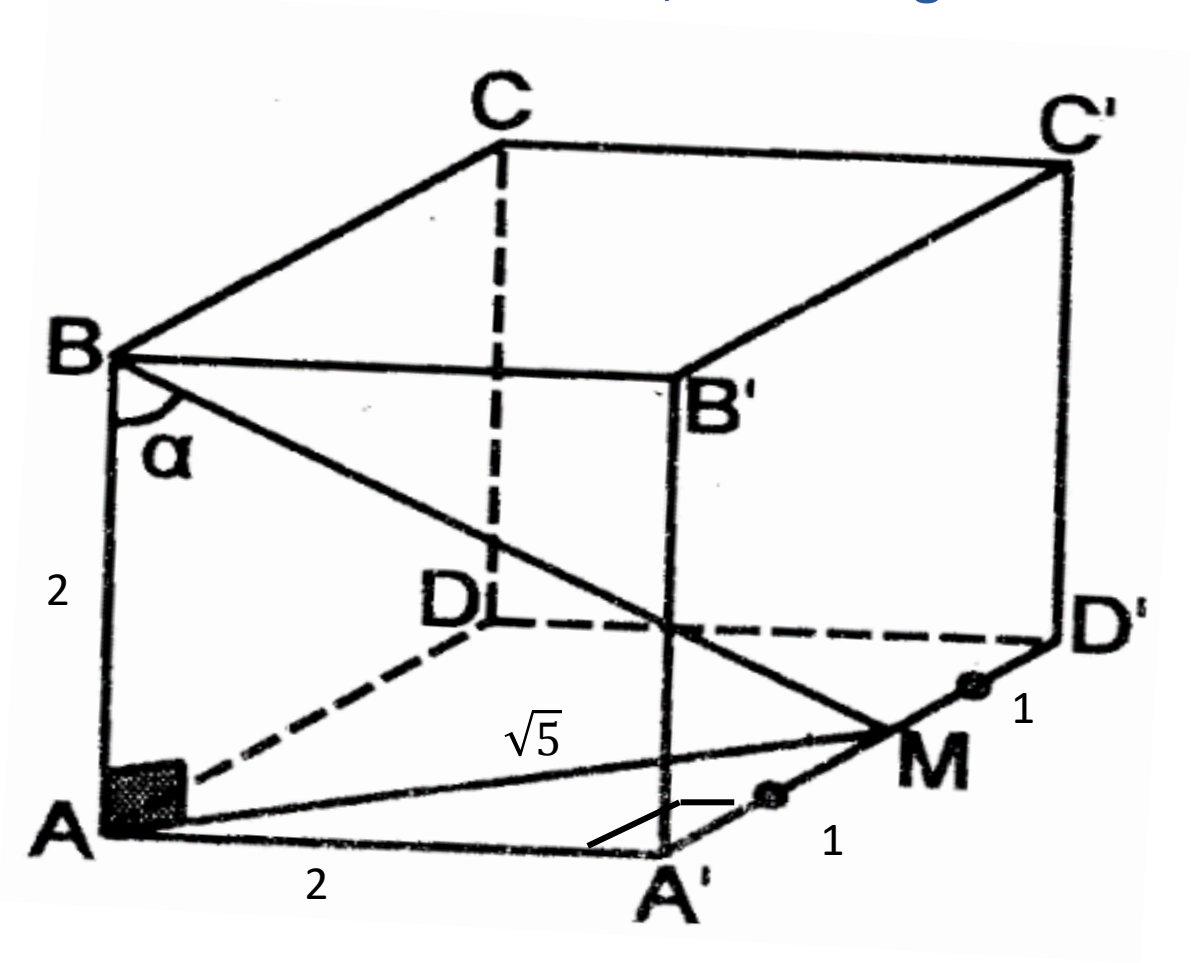
16+20

36°

A)16° B)24° C)32° D)36° E)40°

R.T DE ÁNGULOS AGUDOS

10.- En el cubo mostrado, calcule Tgα.



A)1/2 B)$\sqrt{2}/2$ C)2 D)$\sqrt{3}/2$ E)$\sqrt{5}/2$

Resolución:

En la figura:

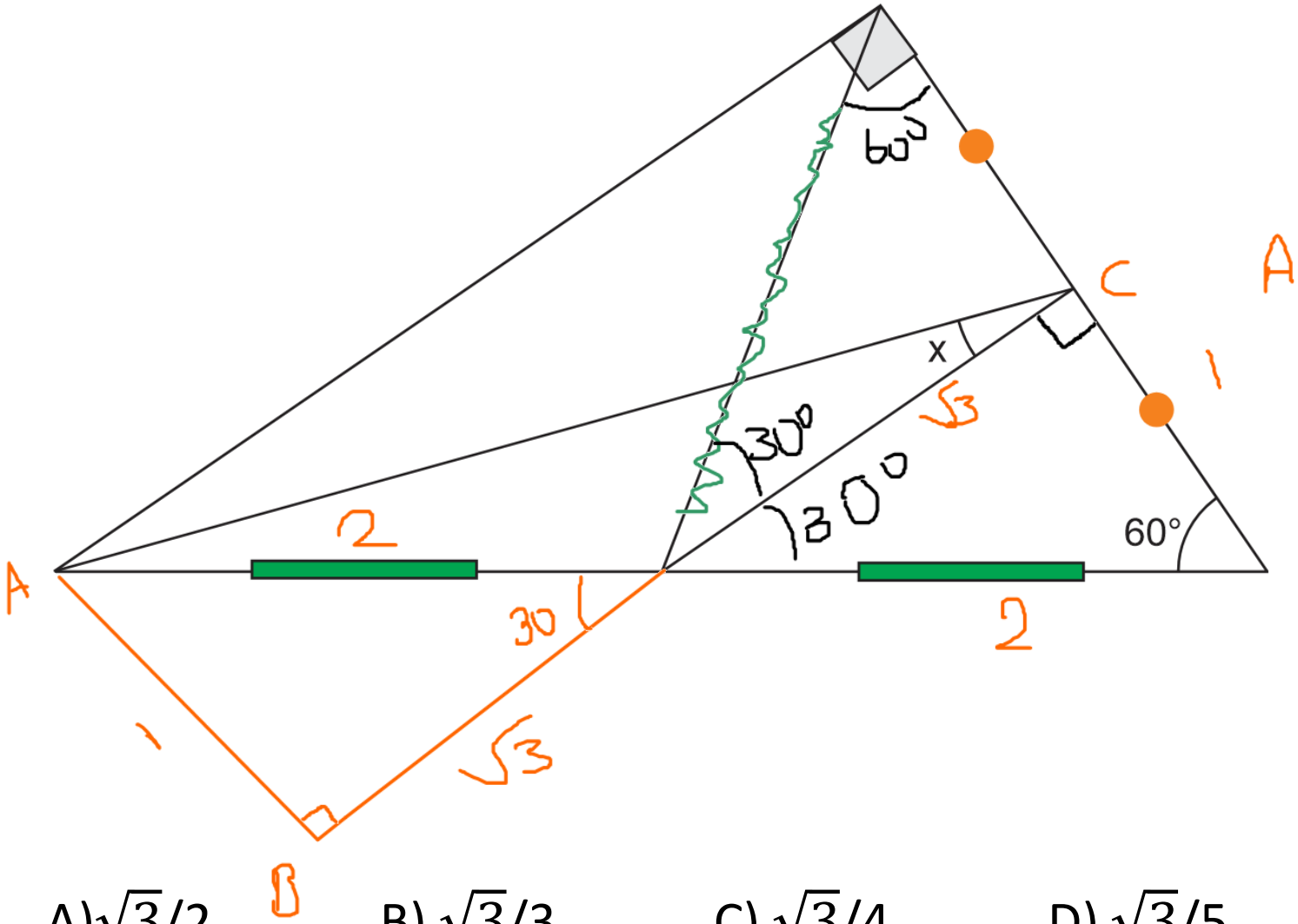
$$\text{Tan}\alpha = \frac{\sqrt{5}}{2}$$

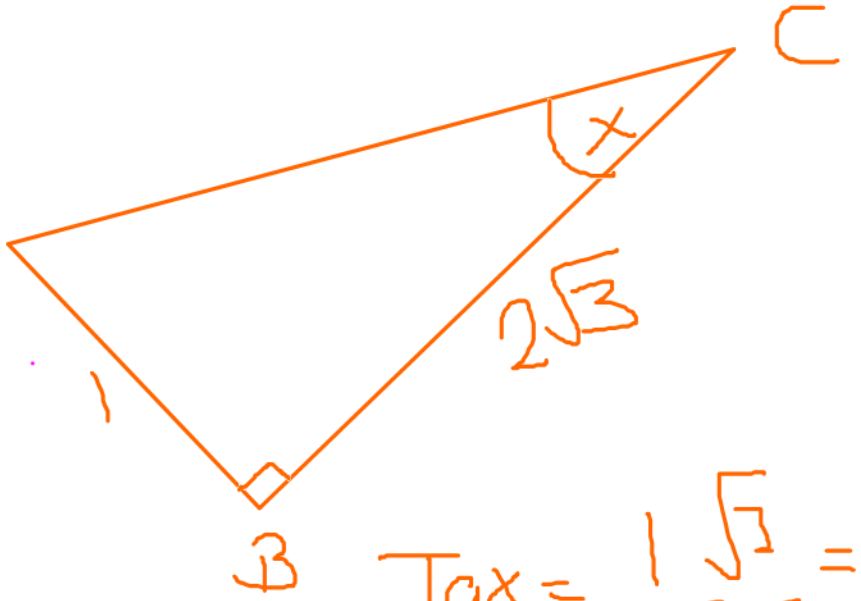
MOMENTO DE PRACTICAR

PROBLEMAS Y RESOLUCIÓN

R.T DE ÁNGULOS AGUDOS

11.-De la figura mostrada, calcular “Tanx”



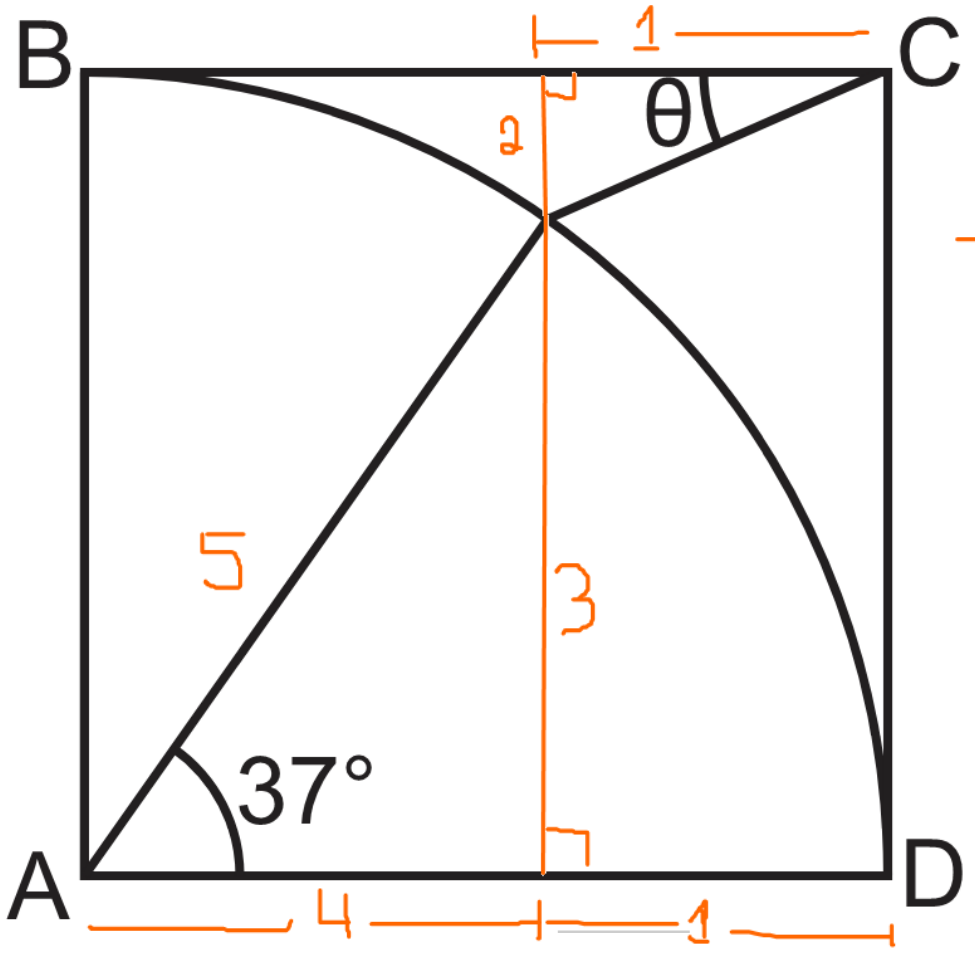


$$Tgx = \frac{1\sqrt{3}}{2\sqrt{3}\sqrt{3}} = \frac{\sqrt{3}}{6}$$

A) $\sqrt{3}/2$ B) $\sqrt{3}/3$ C) $\sqrt{3}/4$ D) $\sqrt{3}/5$ E) $\sqrt{3}/6$

R.T DE ÁNGULOS AGUDOS

12.En el gráfico, Calcule “Tanθ” , si ABCD es un cuadrado

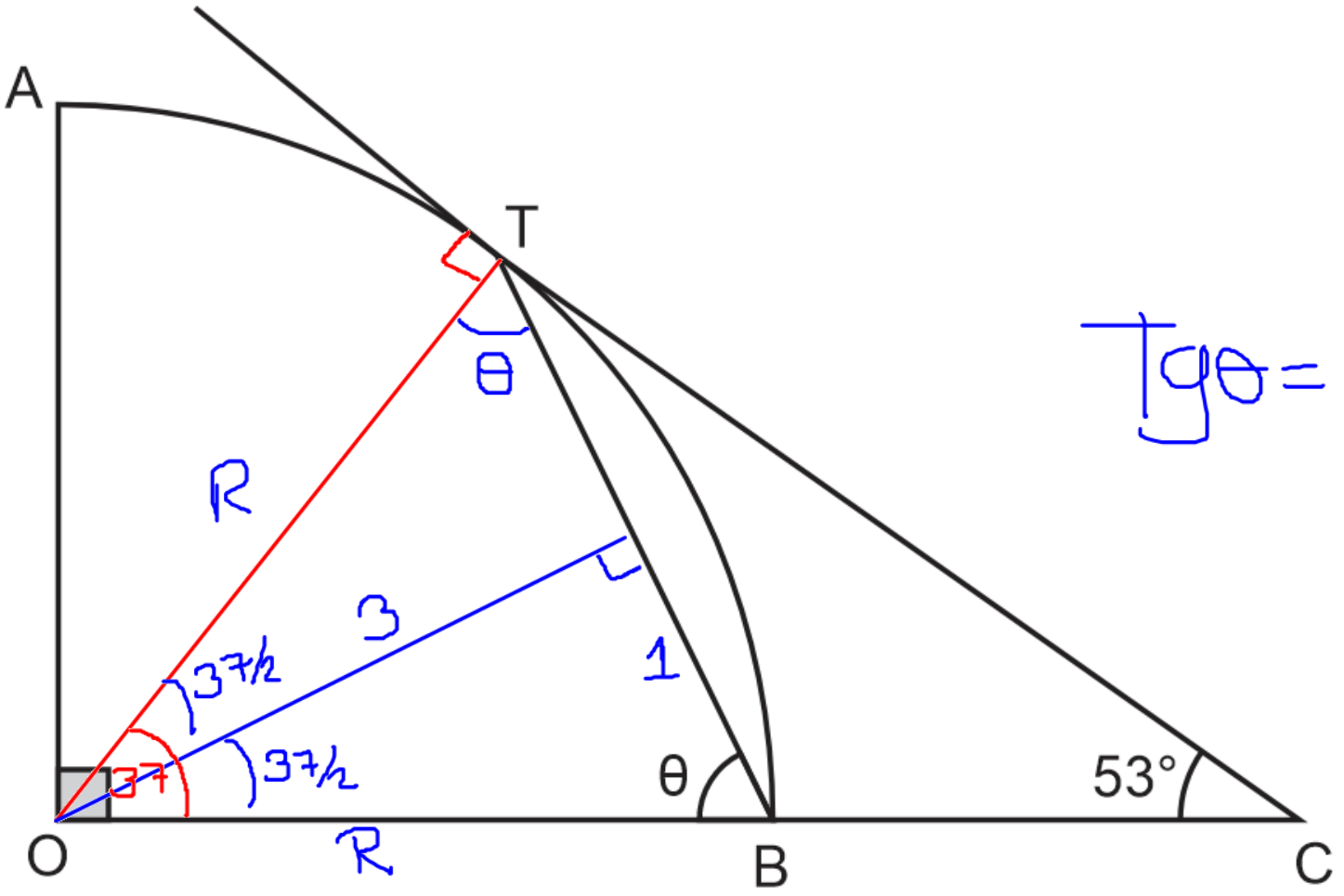


$$Tg\theta = \frac{2}{1} = 2$$

A)1 B)2 C) 3 D) 4 E) 5

R.T DE ÁNGULOS AGUDOS

13. De la figura: calcular Tanθ, siendo T punto de tangencia.

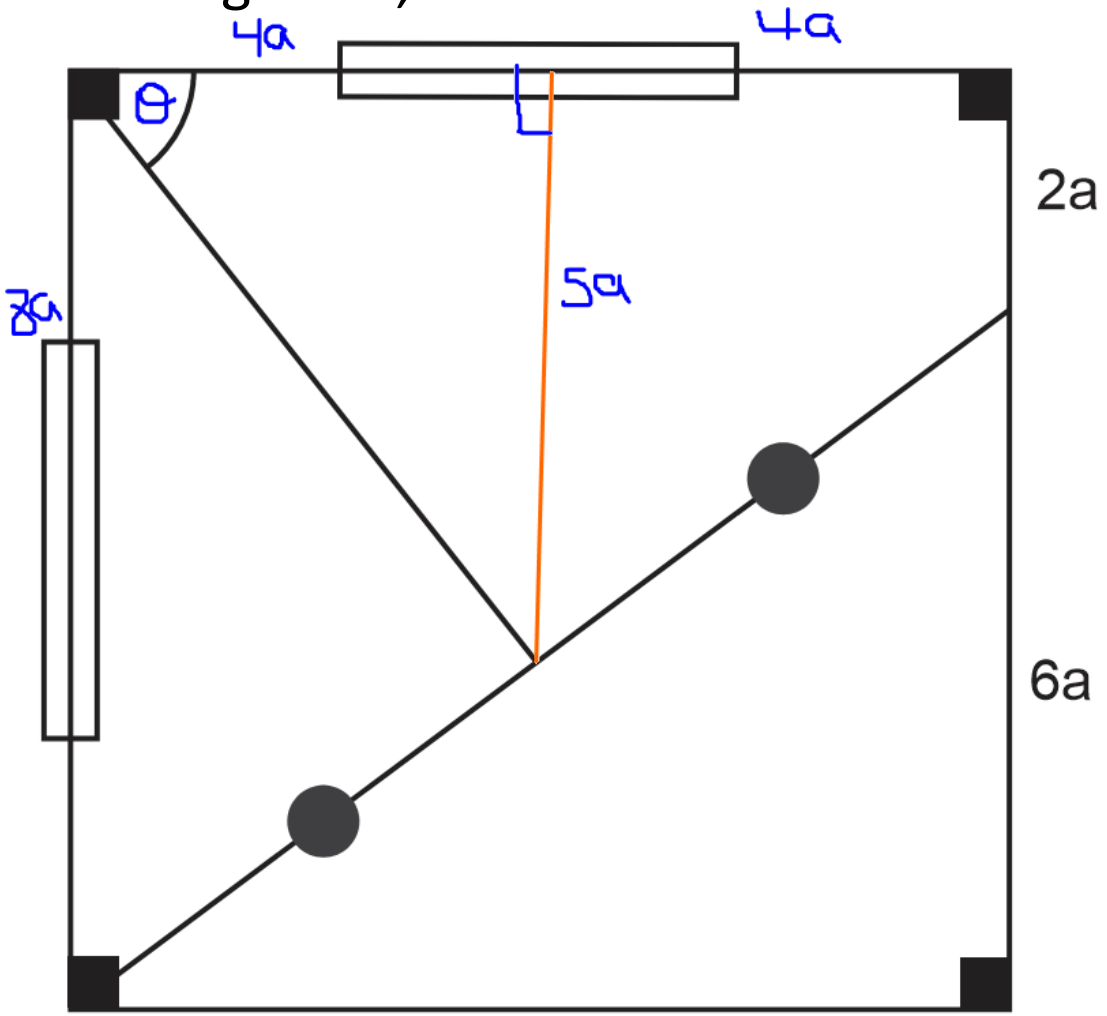


$$Tg\theta = \frac{3}{1} = 3$$

A)1/3 B)5/2 C) 1 D) 2 E) 3

R.T DE ÁNGULOS AGUDOS

14. Del gráfico, calcule “Tanθ”



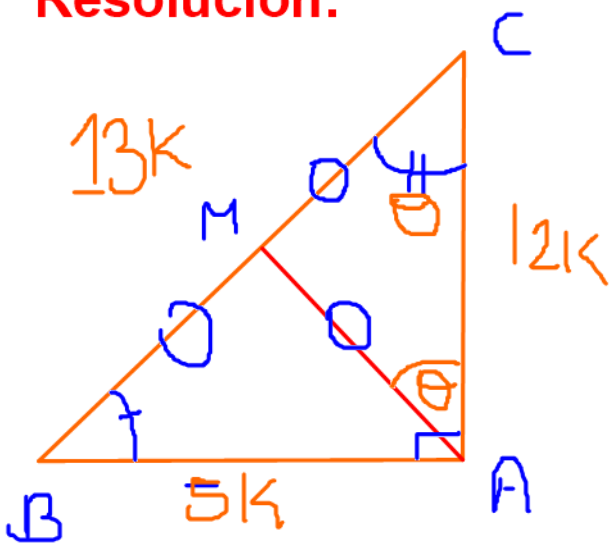
$$Tg\theta = \frac{5}{4}$$

A)3/5 B)5/4 C) 6/5 D) 5/6 E) 3/8

R.T DE ÁNGULOS AGUDOS

15. En un triángulo ABC, m< BAC = 90°, 5AC = 12AB, se traza la mediana AM, Siendo "θ" = m< MAC, calcule: "Secθ"

Resolución:



$$\sec\theta = \frac{13K}{12K} = \frac{13}{12}$$

$$\frac{AC}{AB} = \frac{12K}{5K}$$

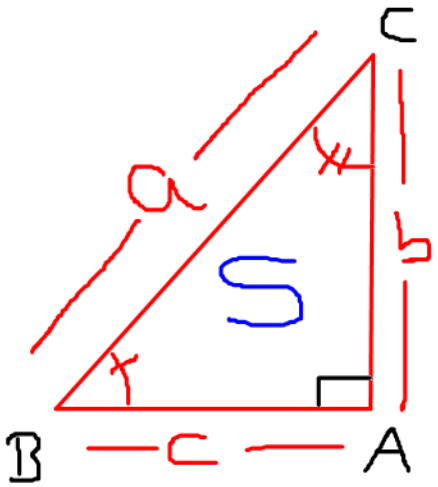
A)13/12 B)13/5 C) 12/5 D) 1/2 E) 1/3

R.T DE ÁNGULOS AGUDOS

16.Sea "S" el área de una región triangular BAC, recto en A, exprese en términos de "S",el Valor de la expresión:

$$E = \frac{(c^2 - b^2)\mathrm{Tan}(B)\mathrm{Sen}^2(C)}{\mathrm{Cos}^2(B) - \mathrm{Sen}^2(B)}$$

Resolución:



$b^2 + c^2 = a^2$

$S = \frac{b.c}{2}$

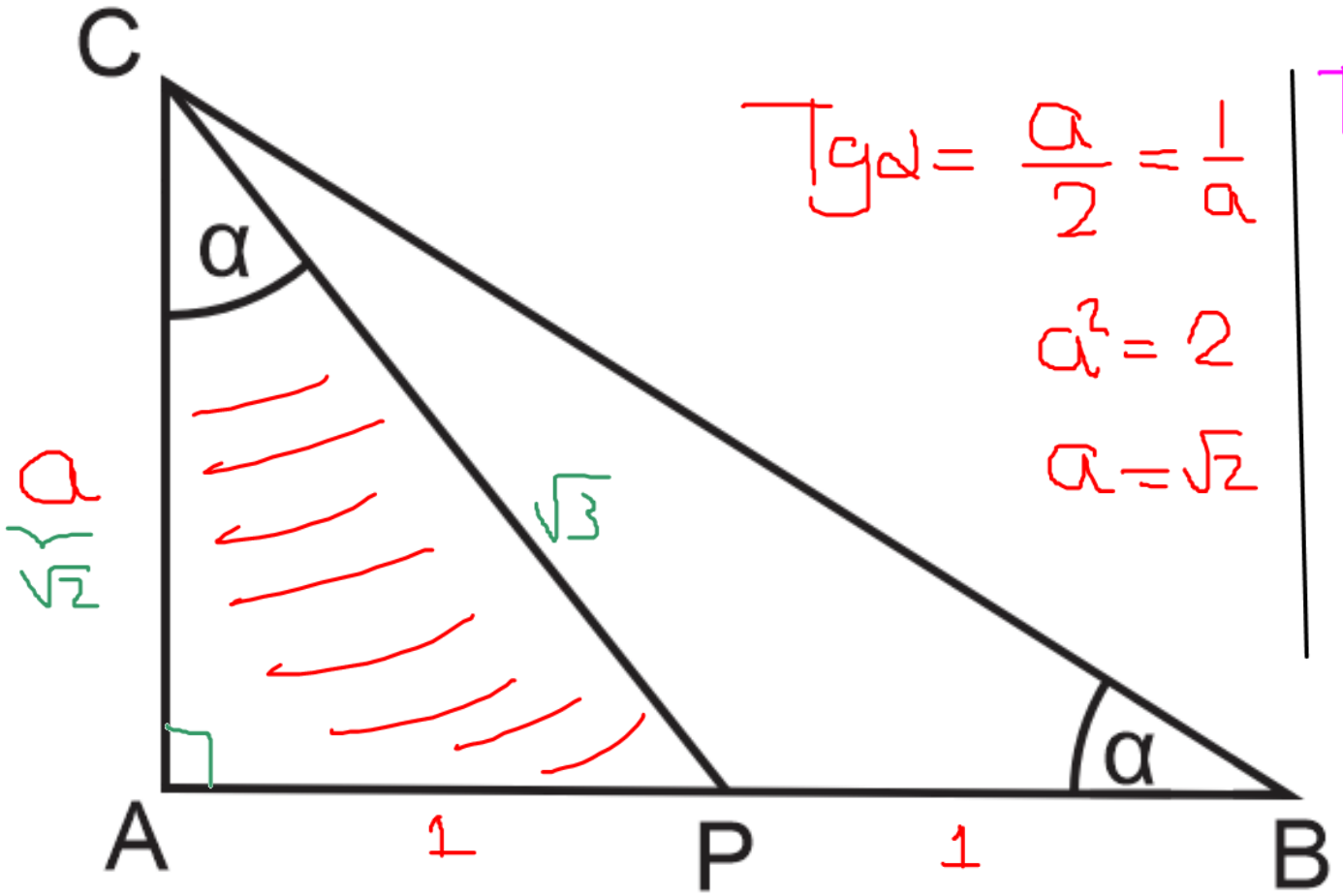
$\boxed{2S = bc}$

$$E = \frac{(c^2-b^2)\left(\frac{b}{\cancel{c}}\right)\frac{c^{\cancel{2}}}{a^2}}{\frac{c^2}{a^2} - \frac{b^2}{a^2}} = \frac{\cancel{\left(\frac{c^2-b^2}{a^2}\right)}bc}{\cancel{\left(\frac{c^2-b^2}{a^2}\right)}} = bc = 2S$$

A) $\frac{S}{2}$ B) $\sqrt{s}$ C) S D) 2S E) 3S

R.T DE ÁNGULOS AGUDOS

17.Si en la figura mostrada AP =PB, Calcule: $\mathrm{Cos}^2\alpha - \mathrm{Tan}^2\alpha$



$Tg\alpha = \frac{a}{2} = \frac{1}{a}$

$a^2 = 2$

$a = \sqrt{2}$

$Tg\alpha = \frac{\sqrt{2}}{2}$

$E = C_\alpha^2 - Tg^2\alpha$

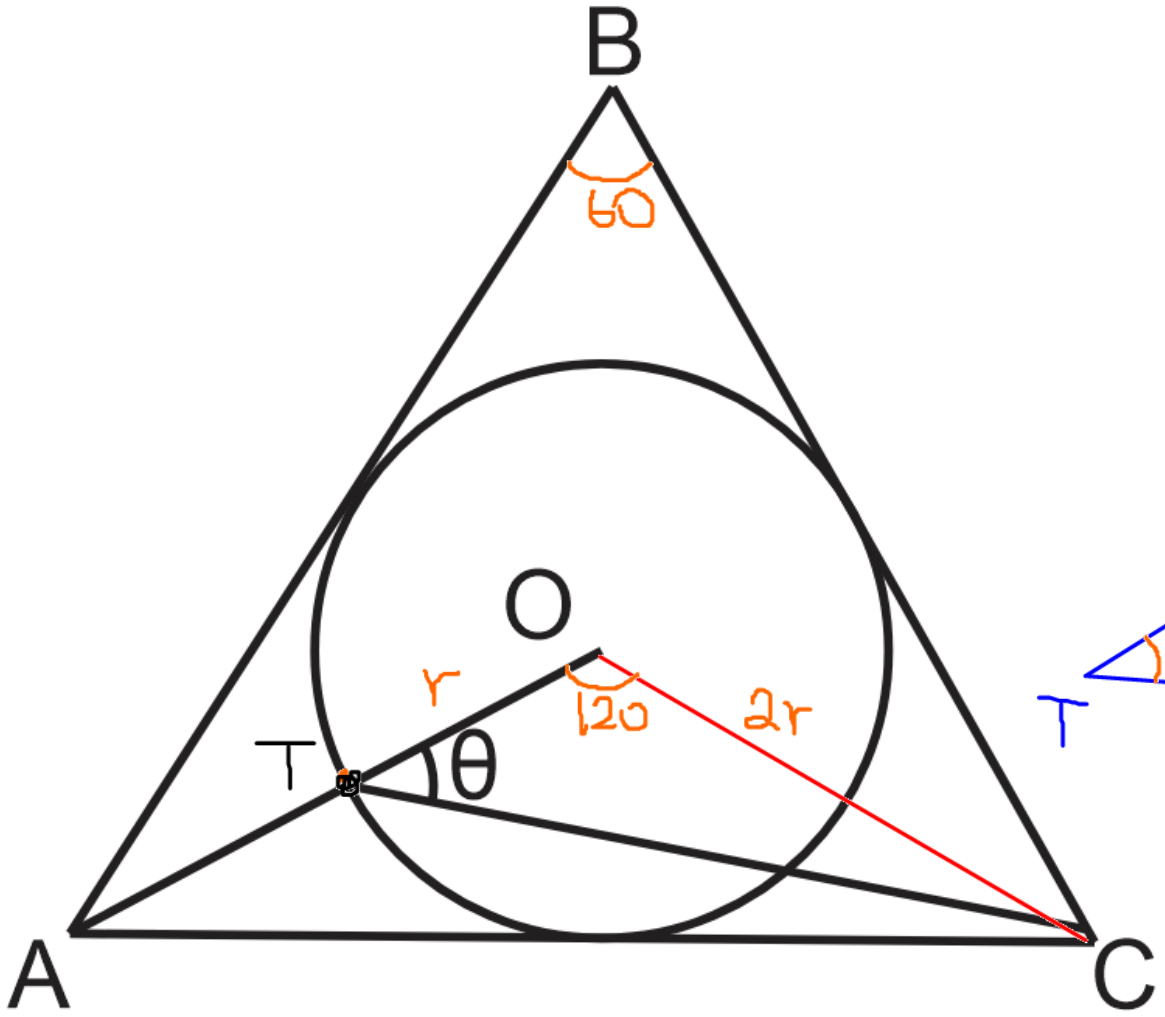
$E = \left(\frac{\sqrt{2}}{\sqrt{3}}\right)^2 - \left(\frac{1}{\sqrt{2}}\right)^2$

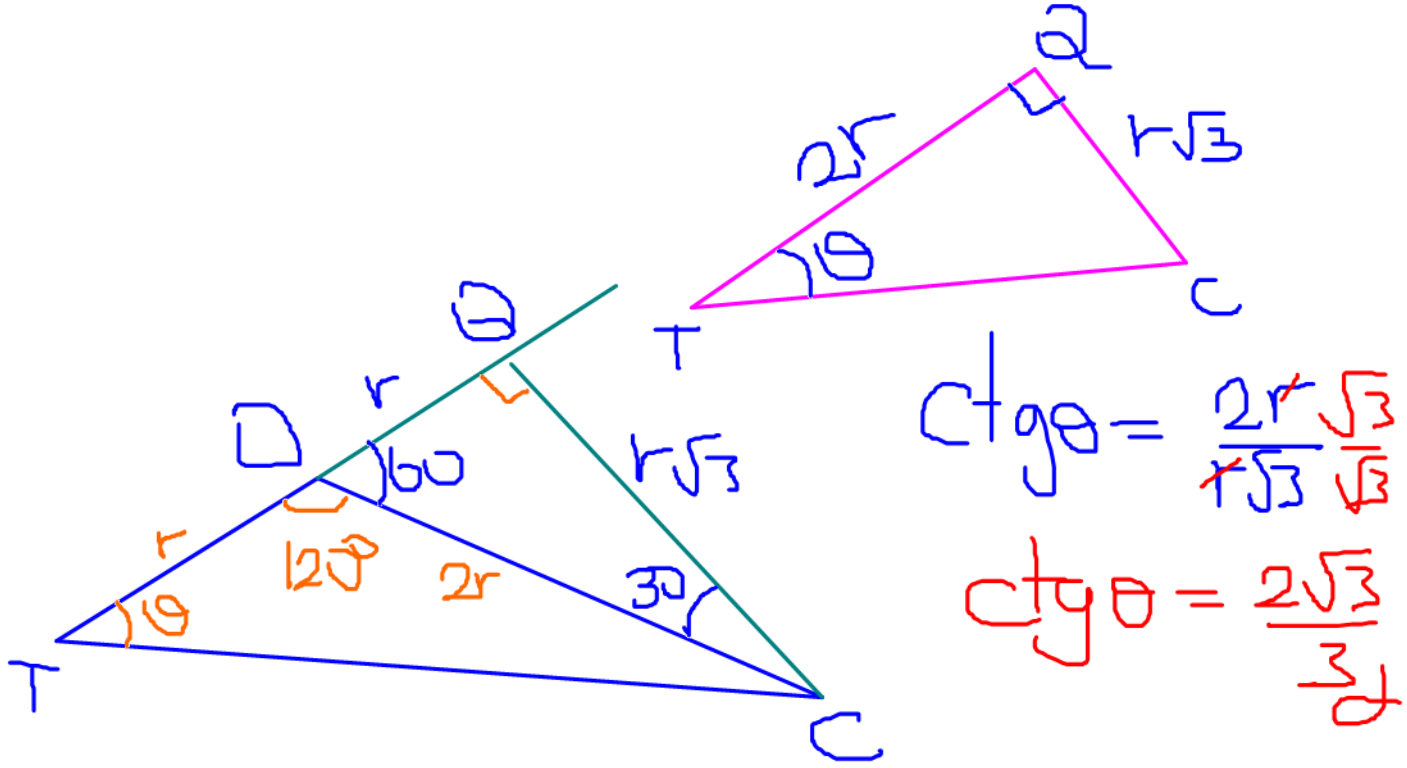
$E = \frac{2}{3} - \frac{1}{2} = \frac{1}{6}$

A)1/8 B)1/6 C) 1/2 D) 3/4 E) 1

R.T DE ÁNGULOS AGUDOS

18. Si el triángulo ABC es equilátero, además “O” es centro, calcule “Cotθ”





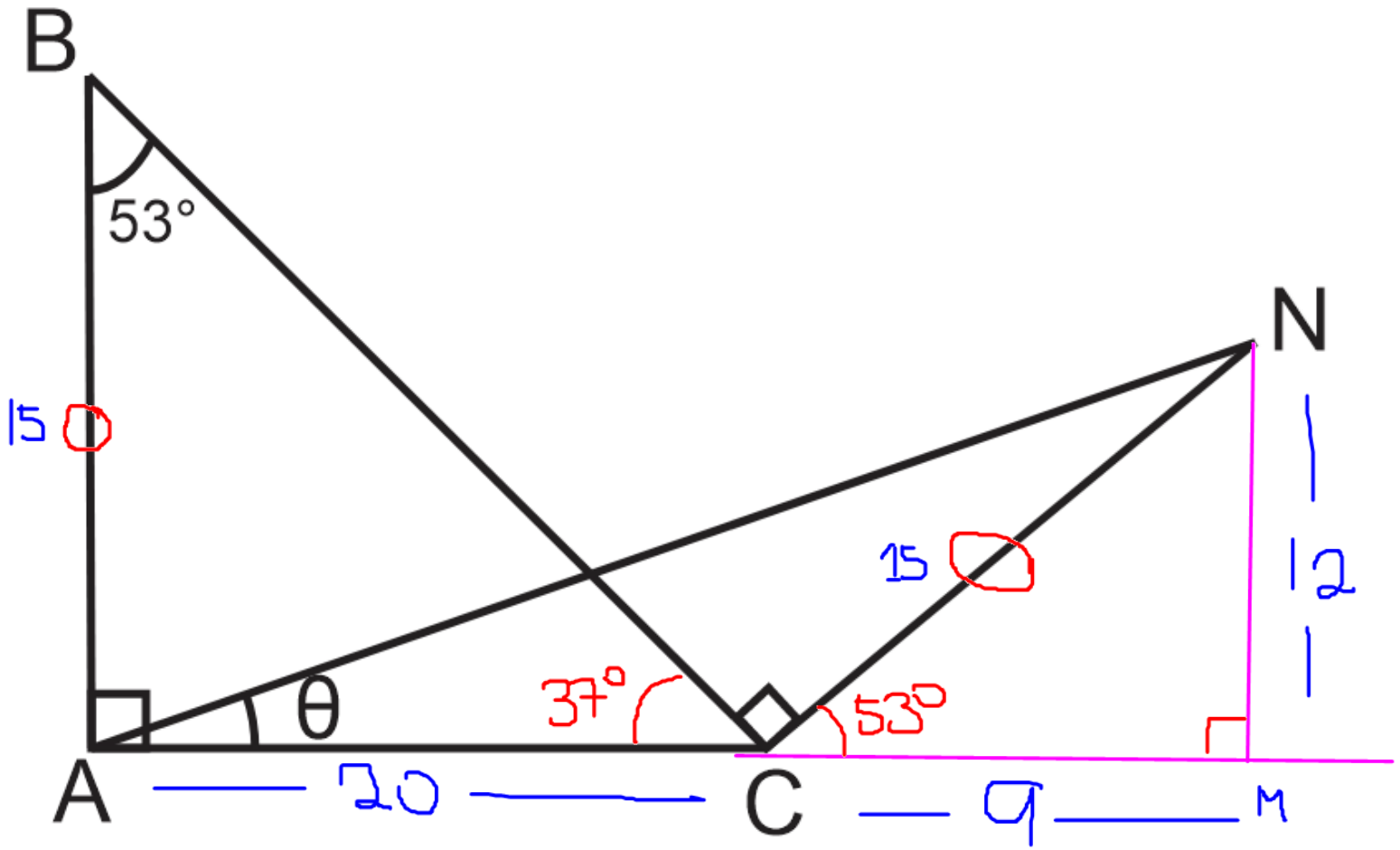
$$ctg\theta = \frac{2\cancel{r}}{\cancel{r}\sqrt{3}}\frac{\sqrt{3}}{\sqrt{3}}$$

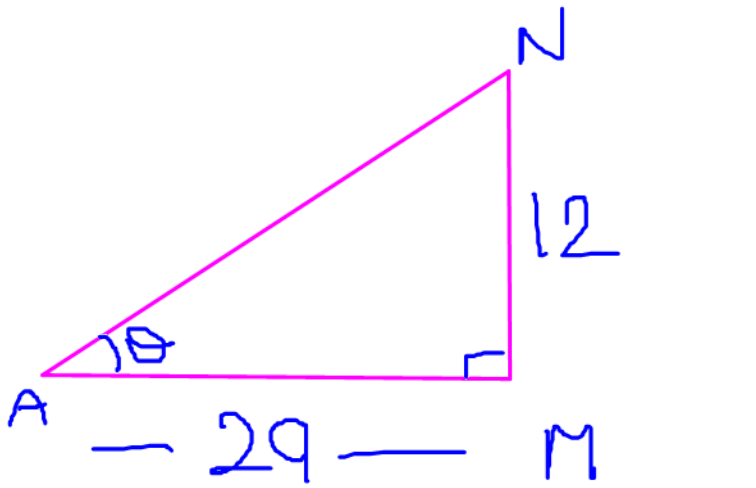
$$ctg\theta = \frac{2\sqrt{3}}{3}$$

A) $\sqrt{6}/6$ B) $2\sqrt{3}/3$ C) $\sqrt{3}/2$ D) $\sqrt{3}$ E) $\sqrt{5}$

R.T DE ÁNGULOS AGUDOS

19. En la figura mostrada, AB = CN. Calcule “Tanθ”



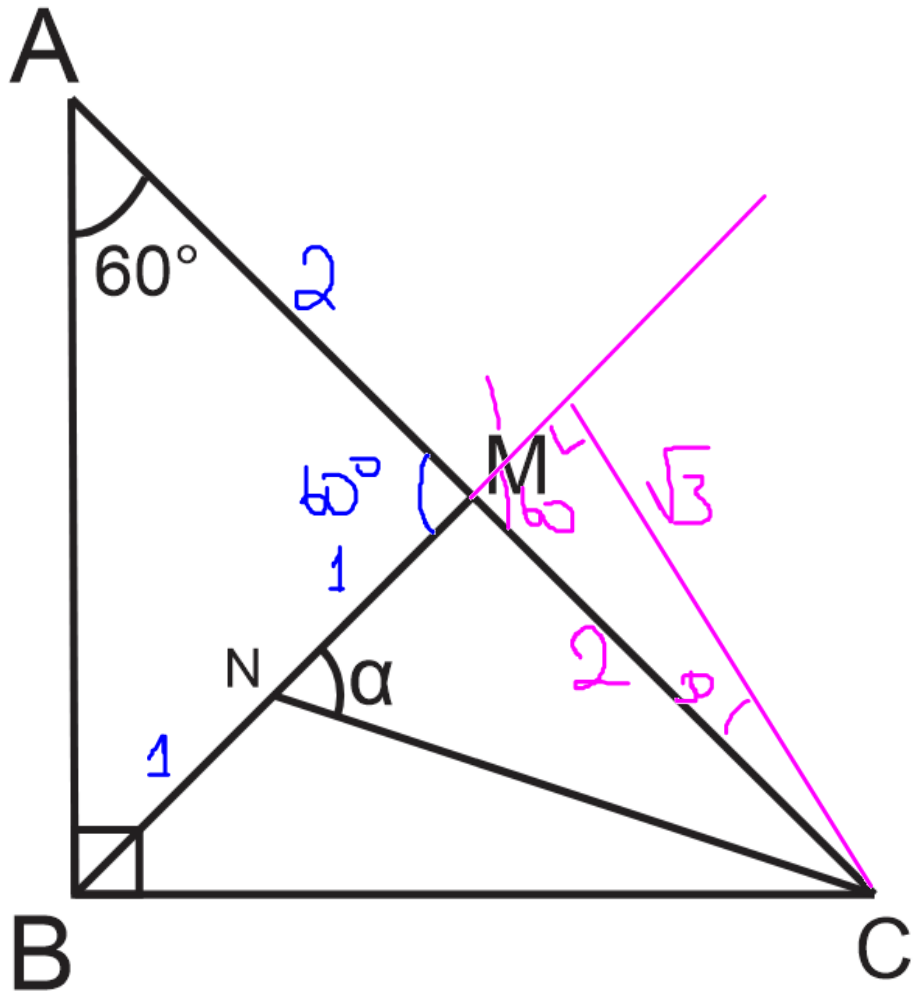


$$Tg\theta = \frac{12}{29}$$

A)11/29 B)12/29 C)3/7 D)4/7 E)3/4

R.T DE ÁNGULOS AGUDOS

20. Si en la figura: AM = MC, BN = NM, Calcule: $\sqrt{7}\text{Cos}\alpha$



$\cos\alpha = \frac{2}{\sqrt{7}}$

$\sqrt{7}\cos\alpha = 2$

A)1 B)2 C) 3 D) 4 E) 5

FIN DE LA SESIÓN

PRACTICA Y APRENDERÁS

CLAVES									
1	2	3	4	5	6	7	8	9	10
11E	12B	13E	14B	15	16D	17E	18	19	20
21	22	23	24	25	26	27	28	29	30